

bromide is attacked by antimony pentachloride, the whole of the bromine being liberated and ethyle chloride formed. The action of antimony pentachloride on ethene bromide differs according to the quantities employed. With the same number of molecules of the two substances the chief product is ethylene chlorobromide, whilst with two molecules of pentachloride to one of ethene bromide the product is ethene chloride. Ethene bromide is not acted on when similarly heated with phosphorous pentachloride. The product of the reaction of acetic acid with antimony pentachloride is monochloroacetic acid, accompanied by another substance with a higher boiling point. When salicylic acid is gradually added to antimony pentachloride, monochloro- and dichloro-salicylic acids are produced along with other products; monochloro-salicylic acid is found in small quantities only. Dichloro-salicylic acid on being boiled with potash for a considerable length of time exchanges its chlorine for hydroxyl, yielding gallic acid accompanied with pyro-gallic and oxy-salicylic acids. When paraoxybenzoic acid is acted on by two or four molecules of antimony pentachloride the mono- and dichlorinated acids are found respectively. From these reactions it is evident that the action of antimony pentachloride differs from that of its analogue, phosphorous pentachloride, since it simply parts with its chlorine, which replaces hydrogen in the acid radical, instead of replacing the hydroxyl group by chlorine, as is generally the case when phosphorous pentachloride acts upon organic substances.

ACTION OF CHLORINE ON PEROXYDES.—MM. Spring and Arisqueta continue (*Bull. Acad. de Belg.*, xlii. p. 565) their researches into the action of chlorine on peroxydes of metals, for the purpose of elucidating the very important question whether the atonicity of certain bodies is variable (as supposed by Kolbe and Blomstrand), *i.e.*, whether whilst one atom of a body in a molecule is, say, tri-atomic and possesses basic properties, another atom of the same body may be pent-atomic and partake of the properties of an acid, or whether the atonicity remains invariable, as supposed by Kékulé and the authors of the paper. Former researches induced M. Spring to conclude that the atoms of chlorine possess constantly the same properties in all their compounds with oxygen, which would be contrary to the alleged varying atonicity. Now, studying the action of chlorine upon the peroxyde of silver, the authors prove, by a very delicate experiment, that its result is the formation of a peroxyde of chlorine, a body prevised by the theory, but unknown until now, and they conclude, therefore, that the structure of peroxydes of silver and of chlorine is identical, which identity gives a new argument in support of the invariability of the atonicity of chlorine and silver.

BORON AND ITS SPECIFIC HEAT.—Boron occurs, it is known, in two different forms, in the amorphous state, and in crystals. M. Hampe has recently found (*Liebig's Annalen der Chemie*) that both the black and the honey-yellow crystals are not pure boron, but compounds of the element; the black crystals consisting of albuminium and boron in the proportions $AlB_{1.3}$, and the yellow crystals of aluminium, carbon, and boron, $C_2Al_3B_{1.8}$. Boron has hitherto been numbered among the few elements which show a departure from Dulong and Petit's general law of the constancy of specific heat into atomic weight, and M. Weber sought the reason for this departure in the case of boron, as in those of carbon and silicon, in the fact that the specific heat varies with the temperatures, but at high temperatures reaches a value which establishes an agreement with Dulong and Petit's law. The determination of the specific heat of boron, however, as also M. Weber's experiments, were made with crystals of boron. Now, since, according to M. Hampe, these crystals are not pure boron, but compounds of it, the whole question as to the validity of Dulong and Petit's law for the pure element boron remains an open one. All the attempts made by M. Hampe to produce pure crystallised boron had been with-

out success. He is engaged in further investigating whether the amorphous boron can be produced in absolute purity.

HEATED AIR.—Dr. Kayser, of Nuremberg, has lately conducted a number of experiments upon the effects of heating ordinary air, with especial reference to the warming of dwellings. The results appear in the last report of the Munich Industrial Museum, and may briefly be summed up as follows:—Air previously free from carbon monoxide was invariably found to contain this gas after heating. The tests were performed with chromic acid, and also with cuprous chloride. In order to test the products of the decomposition of the dust present in the air, about sixty litres of air, which had been heated, were drawn through an ordinary apparatus for determining carbonic acid, which contained absolute alcohol. The liquid assumed a yellowish brown colour, and flakey masses were suspended in it. The flakes were found to consist chiefly of carbon. After filtration and evaporation of the solution, a brown residue was obtained. This was insoluble in water, intensely acrid, and possessed a resinous, empyreumatic odour. The estimations of carbonic acid and water before and after heating showed no difference worthy of mention.

NOTES

CONTRIBUTIONS are being collected in Stockholm for the establishment of a scientific college. The *Dagblatt* states that steps will be taken at once to fill the chairs in philology, the natural sciences, history, &c.

BARON VON RICHTHOFEN, for a long series of years president of the Berlin Geographical Society, has accepted a call to the Chair of Geography in the University of Bonn.

THE large collections brought back by the German exploring expedition in the *Gazelle* under the command of Baron v. Schleinitz have been formed into a separate museum in Berlin. The ethnographical section is especially rich and valuable, embracing many objects brought from islands where the natives are rapidly disappearing.

THE Society for African Exploration at Berlin has been amalgamated with the newly-formed German branch of the international societies, under the leadership of the King of Belgium. During the three years of its existence it has been exceedingly active, and has expended the following sums:—Dr. Giissfeldt's Loango expedition, 9,200*l.*; expedition of Homeyer, Lux, and Pogge to the Cassandje, 1,000*l.*; Dr. Lenz's journey to the Ogowe, 1,000*l.*; various stations and shorter excursions, 2,500*l.* It has at present over 5,000*l.* in its treasury. The first session of the newly-formed *Deutsche afrikanische Gesellschaft*, was held in Berlin on January 16. The society confines its field of operations to Central Africa, proposing to open up this region "to civilisation, travel, and commerce, by the establishment of permanent stations and the maintenance of exploring parties." The energies of the society will also be directed to the repression of slavery. A letter was read from the Crown Prince of Germany, expressing his desire to take an active part in furthering the objects of the Society. A request for pecuniary assistance from the Government has already been presented to the Chancellor of the Empire.

THE Berlin *Afrikanische Gesellschaft* has received telegraphic news from Dr. v. Pogge, the African explorer, who landed last week in Lisbon, stating that he had succeeded in penetrating to the long-sought-for country of King-Muata Yambo in Central Africa. A detailed report is awaited with interest in geographical circles.

DR. O. LENZ, the African traveller, has been forced to return to Europe with a shattered constitution. For a number of years

he has indefatigably pursued his researches in equatorial Africa, having led, during this period, the three German exploring expeditions into the Ogowé and Gaboon region.

THE Council of the Italian Geographical Society have agreed to present Sir George Nares with its gold medal.

At the last meeting of the Paris Geographical Society the Abbé Durand gave an address, the object of which was to prove that the Portuguese crossed Central Africa in the fifteenth and sixteenth centuries, from the Congo to Mozambique.

THE Norwegian geologist, K. Pettersen, is planning a new expedition to Spitzbergen during the coming summer, which shall aim at a thorough geological survey of the island. A petition has been presented to the Norwegian Government requesting a grant for the undertaking.

At the meeting of the Royal Geographical Society on Monday, Dr. Mullens read a paper on "Later Explorations in Madagascar," giving an account of five journeys of unusual importance, and over entirely new ground, by English missionaries in Madagascar during the last two years.

ON January 13 the Sumatra Expedition of the Dutch Geographical Society embarked at Nieuwediep for the east. A corps of leading scientific men have been gathered together for this expedition, and interesting as well as valuable results are expected from their researches. A great portion of their time will be devoted to the exploration of the as yet unvisited Diambi region, which is represented by the natives as abounding in useful woods and minerals. The Dutch Government has displayed a lively interest in the undertaking, and has placed at the service of the expedition a steamer completely fitted out for a two years' cruise. If favourable reports are brought back it is intended to send colonies to the above-mentioned district.

ON January 10 the St. Petersburg Academy of Sciences celebrated its 150th annual anniversary in an extraordinary gathering, at which the Emperor and royal family were present. Count Lütke, the president, reviewed the past activity of the Academy in a short address. The great medals of merit were assigned this year to Profs. Beilstein and von Bunge. The Emperor of Germany and M. Lesseps were among the list of those elected as honorary members. Among the fourteen leading scientific men elected as corresponding members, were Profs. Frankland, Newton, and Wright, England; Prof. Kirchhoff, of Berlin; Prof. Fiorelli, of Naples; Profs. Berthelot, Egger, and Decaisne, of Paris.

ON January 12, Prof. Wilhelm F. B. Hofmeister, one of the leading German botanists, died at the age of fifty-two. Although a self-taught botanist, he attracted attention at an early age by his publications on embryology and the physiology of plants, and was elected member of several royal academies. In 1863 he was called to the ordinary professorship of botany in Heidelberg, and in 1873 accepted a call to Tübingen, where he was active until the time of his death. But a short time since he received from Holland the great medal of Boerhaave—worth 75*l.*—in recognition of his botanical investigations. Among Prof. Hofmeister's principal works are "Die Entwicklung des Embryo der Phanerogamen. Eine Reihe mikroskopischer Untersuchungen," "Vergleichen der Untersuchung der Keimung, Entfaltung und Fruchtbildung höheren Kryptogamen, und der Samenbildung der Coniferen," and an extensive handbook of physiological botany, published in conjunction with de Bary, Irmisch, and Sachs.

WE regret to record the death, on the 11th inst., of Mr. Alfred Smee, F.R.S., F.C.S., F.R.C.S., F.L.S., &c. Mr. Smee was born June 18, 1818. He was educated at St. Paul's School, and afterwards at King's College and St. Bartholomew's

Hospital, and was elected Fellow of the Royal Society at the early age of twenty-one. As an eminent and well-qualified medical man he held many offices, including that of Surgeon to the Bank of England. To scientific men he is best known as the inventor of the battery known as Smee's Battery, and which for certain purposes is still more useful than any other form of battery. For this he got the Gold Medal of the Society of Arts in 1840. He was author of numerous works, of which we note the following:—"Elements of Electro-Metallurgy," "Sources of Physical Science," "Elements of Electro-Biology," "On the Monogenesis of Physical Forces," "Lecture on Electro-Metallurgy," "My Garden," "The Mind of Man."

THE French *Official* publishes the regulations for the appointment of professors of hydrography by the Government. There are to be three classes of them. The third class is to be recruited by competitive examination from officers of the national navy and captains of the mercantile navy. They are to be appointed by the President of the Republic, according to the award given by the jury of admission. The jury is to be composed of an admiral or vice-admiral president, two examiners from the marine department, a hydrographical engineer, and a professor of hydrography.

THE credit asked by the French Government for public instruction in 1878 is 52,000,000 francs. In 1877 it was 49,000,000, and in 1876 only 39,000,000.

THE electric light is becoming common in Paris in connection with works that have to be carried on during the night. A large lamp fed by a six-horse power has been established in the Avenue de l'Opéra, and others are employed in the Trocadero in connection with the building of the Exhibition Palace. The gramme machine and screw regulator are employed.

THE first number is issued of an important publication, *The Wild Flowers of America*, by Dr. G. L. Goodale, Professor in Harvard University, with coloured illustrations by Isaac Sprague. The present number consists of figures of five species, in four plates, and the plates are accompanied by a botanical description together with some gossip about folk-lore, popular names, &c. The paucity of figures of even the commoner American plants will render the work very welcome to botanists. The name of the artist is a sufficient guarantee of the faithfulness of the drawing, and the colouring appears to us to be successful.

CAPT. H. W. HOWGATE, Acting Signal Officer, U.S.N., suggests the following method of attaining the North Pole:—To be able to take advantage of the occasional breaking-up of the ice-barrier with the greatest certainty and with the least expenditure of time, money, and human life, it is essential that the exploring party be on the ground at the very time the ice gives way and opens the gateway to the long-sought prize. This can only be done by colonising a few hardy, resolute, and experienced men at some point near the borders of the Polar Sea, and the most favourable one for the purpose appears to be that where the *Discovery* wintered last year. Such a party should consist of at least twenty men, and should be provided with provisions and other necessary supplies for three years, at the end of which period they should be visited, and, if still unsuccessful in accomplishing the object, reinvigorated and again left to their work. It is stated that an effort will be made to induce the U.S. Government to adopt this plan.

BEHM's last *Geographischer Jahresbericht* shows a total of thirty-six geographical societies in existence at present.

DURING the middle of January the South of Norway has been visited with the severest snowstorm experienced since 1818. In some of the villages snow covers the roofs of the houses to the depth of sixteen feet, and dwellings have been unable to sup-

port the overlying weight. Communication is dependent upon the use of snow-shoes.

THE Prussian Universities granted during the past year 500 doctor's diplomas upon the basis of a thesis and oral examination. Göttingen bestowed 139, Berlin, 90. Twenty honorary degrees were granted during the same period.

M. FIZEAU has been elected Vice-President of the French Academy of Sciences for the coming year, from the section of the mathematical sciences; the President is M. Peligot. Of the Academy's *Mémoires*, tome xxxix., in course of publication, is reserved for works of M. Chevreul, on dyeing, on an error of reasoning frequent in sciences which are concerned with the concrete, science in relation to grammar, history of opinions on the chemical nature of bodies of chemical and living species, &c. The Academy is also publishing a number of documents on the Transit of Venus. Tomes xxiii., xxiv., and xxv. of *Mémoires des Savants Étrangers* contain memoirs on the theory of running waters, a system of irrigation, the succinic series, the carboniferous flora of the department of the Loire, the transformation and equivalence of chemical forces, the transparency of flames, vision of scintillating lights and nocturnal transparency of the atmosphere, the Phylloxera, &c.

THE *Bulletin de la Fédération des Sociétés d'Horticulture de Belgique* for 1875 is just published, and illustrates the great activity with which this branch of science is pursued in the little kingdom. Besides the official papers connected with the federation, and reports from twenty-five associated societies, the volume contains the "Correspondance botanique" for that year, a list of botanists and horticulturists holding official positions throughout the world, a sketch of the life of Mathias de l'Obel (Lobelius), by E. Morren, and several other papers by the same writer.

MR. THOMAS COMBER reprints from the *Transactions* of the Historic Society of Lancashire and Cheshire, a useful paper entitled "Geographical Statistics of the Extra-British European Flora," containing a considerable mass of information which will be valuable to anyone interested in the subject of the distribution of continental species, and the causes of the range which they now enjoy.

HUNGARY is developing no small degree of activity in matters of scientific interest. The president of the Royal Society for Natural Sciences at Pesth reported in the annual Session of January 17, that the present membership amounts to 4,650. Five subjects for prize treatises were announced, one of which was on the chemical resources and industries of the kingdom.

THE phenomenon of the "black drop" has recently been made the subject of experimental study by M. Ch. André, who has communicated his results to the French Academy. Without stopping to describe his artificial transit, we may state that he had a battery communicating with the planet Venus, the other with the limb of the sun; and at the moment of geometrical contact a current was produced, which was registered on a Breguet chronograph. On the same instrument was inscribed parallelly the hour given by a Winnerl pendulum, and the mark produced by the observer pressing down a Morse key. The conclusions of M. André are, shortly, as follows: The black drop is not an accidental fact, but one that is necessary and characteristic of the phenomenon. With sufficiently strong light, the bridge is always produced at the moment of geometric contact, however perfect the telescope. It may be made to disappear entirely in the retinal image, either by increasing sufficiently the absorbent power of the dark glass used, or by placing before the objective a screen formed of a large number of very narrow rings separated by dark rings of the same width, also by diminishing the intensity of the luminous source. In each case

the transit is produced in a geometric manner. All these facts accord with the theory of diffraction rightly interpreted. The ligament is not a real obstacle to observation of the transit. There is a *simultaneous phase* for all telescopes, whatever their apertures, which corresponds to geometric contact, and after a suitable education one may observe with an error equal at the most to 0.75s. for internal contact of ingress, and 1.50s. for internal contact of egress. The total error, then, may be reduced to 2.5s. Now to have the solar parallax to a hundredth of second of arc, it is sufficient not to commit, in the duration of transit, an error above five seconds of time; hence the observation of the transit of Venus may furnish this parallax to nearly five-thousandths of a second of arc.

A PAIR of Kœnig Ut^4 forks will show the phenomenon of sympathetic resonance at much greater distance than a pair of Ut^3 forks. The common explanation is that as double the number of impulses are delivered in a second, double the energy is conveyed to the distant fork. This is questioned by Mr Robert Spice (*American Journal of Science and Arts*), in view of the law of forces radiating from a centre. At twenty feet, in fact, the intensity of resonance of Ut^4 forks is undoubtedly greater than the intensity of Ut^3 forks at six feet. With Ut^3 forks of bell-metal he got, at forty feet, a greater result than that obtained with the steel Ut^4 forks of Kœnig. The hypothesis he offers is this: *The intensity of sympathetic resonance of forks on their cases increases with the angular deviation or motion of the prongs.* By means of an electro-chemical registering apparatus Mr. Spice finds that when a fork (between Ut^3 and Ut^4) is in vibration, its stem or handle alternately rises and falls in accord with the period of the fork, through about $\frac{1}{8}$ inch. In sympathetic resonance the case gives the stem this up-and-down motion, which is conveyed to the prongs and sets them in motion, as a hand might start a pendulum suspended from it (by moving laterally, say, one inch each way). This motion of $\frac{1}{8}$ inch may be looked on as a constant. If we decrease the length of the fork without altering the constant, we thereby allow of a greater initial angle, the result of which is the same as shortening the pendulum cord. Thus we are in a position to explain the deportment of the bell-metal forks. The velocity of sound in bell-metal is much less than in steel; hence, retaining similar thicknesses in both cases, an Ut^3 fork in bell-metal would be shorter than an Ut^3 fork in steel. Therefore, though we retain the vibration number, we gain advantage from the shortness of the fork, and hence from the increase of angular motion of the prongs.

THE applicability to liquids of Kirchoff's law as to the subdivision of galvanic currents in bifurcating metallic conductors having been doubted, Prof. Lenz has recently (*Bull. de l'Ac. de St. Pétersb.*, vol. xxii., No. 3) made a series of experiments with solutions of sulphates of copper and zinc and of nitrate of silver. He arrives at the conclusion that the subdivision of galvanic currents in liquids follows exactly the same laws as their subdivision in metallic conductors.

In a paper "On Evolution in Geology," in the January number of the *Geological Magazine*, Mr. W. J. Sollas, starting from the ground that the energy of the earth and the sun is a continually diminishing quantity, and must at the beginning of geological history have been far in excess of its present amount, briefly discusses the influence of this greater quantity of energy on geological changes. He arrives at the conclusion that all main factors of geological changes, viz., the denudation, reproduction, and the elevation and depression of strata, must have notably and rapidly decreased in intensity; and, alluding to the opposition met with from geologists by Sir W. Thomson's views, he insists on the mistake of attempting to check the results as to the age of the world obtained by the physicist with those de-

duced by the geologist," which last are based on the rate of changes produced now, during a period of diminished energy of all main geological factors.

THE Chair of Botany at Aberdeen, we learn from the *Gardener's Chronicle*, is likely to be vacant shortly. Among the candidates are mentioned the names of Dr. J. B. Balfour, Rev. Dr. Brown, Dr. W. R. M'Nab, and Dr. Traill.

MR. C. P. OGILVIE, who has been studying the art of aquarium management at the Royal Aquarium, Westminster, has been appointed Curator and Resident Naturalist to the aquarium recently completed at Great Yarmouth, Norfolk.

THE distance between Paris and Marseilles is 863 kilometres, not 1,820, as stated in our note on p. 266 last week.

THE additions to the Zoological Society's Gardens during the past week include a Malbrouck Monkey (*Cercopithecus cynosurus*) from East Africa, presented by Mr. L. C. Brown; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mrs. Cecil Long; a Pig-tailed Monkey (*Macacus nemestrinus*) from Java, presented by the crew of H.M.S. *Dwarf*; a Bay Lynx (*Felis rufa*) from North America, presented by Mr. W. Otho N. Shaw; two Teguxin Lizards (*Teius teguxin*) from South America, presented by Mr. A. Stradling; an Ocelot (*Felis pardalis*), an Azara's Fox (*Canis azarae*) from South America, a Tataupa Tinamou (*Crypturus tataupa*), two Talpacoti Ground Doves (*Chamaepelia talpacoti*), two Scaly Doves (*Scardafella squamosa*) from Brazil, a Chopi Starling (*Aphobus chopi*), a Chilian Sea Eagle (*Geranoaetus aguiä*) from Pernambuco, deposited; two Ring-tailed Lemurs (*Lemur catta*) from Madagascar, purchased.

SCIENTIFIC SERIALS

THE *American Journal of Science and Arts*, January.—Contributions to meteorology, being results derived from an examination of the observations of the United States Signal Service, and from other sources, by Elias Loomis.—On some points in connection with vegetation, by J. H. Gilbert.—Observations on a property of the retina first noticed by Tait, by Ogden N. Rood.—On grains of metallic iron in Dolerites from New Hampshire, by George W. Hawes.—On certain phenomena of binocular vision, by Francis E. Nipher.—Notes on the Vespertine strata of Virginia and West Virginia, by William M. Fontaine.—On the production of transparent metallic films by the electrical discharge in exhausted tubes, by Arthur W. Wright.

THE *Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westfalens* (Jahrg. 33, Part 1.) contain the following papers of interest:—Geological, Mineralogical, and Anthropological Section: On some new discoveries in the Jurassic formation west of the river Weser, by W. Treukner.—On a diseased ox's rib from the calcareous tuff-stone in the vicinity of the Toenistein saline spring (Rhenish Prussia), by Prof. Schaaffhausen.—On some bronze implements found near the Weser river, by the same.—On a petrified piece of wood with the image of a human face, by the same.—On the so-called periclinic combinations of Albite by Prof. vom Rath.—On Skodidite-crystals, on plagioclase, and on Brookite crystals, by the same.—On a pine cone found near Dormagen, on the Rhine, together with Roman coins and antiquities, by Prof. Schaaffhausen.—On Capellini's researches on pliocene man in Tuscany, by the same.—On some stone implements recently found, by the same.—On geological researches made at Nagyag and Vöröspatak, in Transylvania, by Prof. vom Rath.—On olivine from Dockweiler and on crystallised slakes, by Dr. Mohr.—Physical Section: On Mallet's theory of volcanic force, by Prof. A. von Lasaulx.—On a further simplification of the electro-dynamic fundamental law, by Prof. Clausius.—On anomalous dispersion of light, by Prof. Ketteler.—On the effects of a stroke of lightning, by Herr Gieseler.—Zoological and Anatomical Section: Synoptical review of the genera and species of *Stilpnoida*, by A. Förster.—On the respiration of *Limnæa*, by Prof. Troschel.—On a specimen of *Pediculus capitis* with extremely

large system of tracheæ, by Dr. Bertkau.—On Dareste's investigations on the reproduction of eels, by Prof. Troschel.—On the *Cephalopoda* of the German upper chalk, by Dr. Schlüter.—On the spermatogenesis of *Amphibia*, by Prof. von La Valette St. George.—Botanical Section: On the influence of interior and exterior causes upon new formations in plants, by Prof. Vöchting.—On the fruit of *Raphia taedigera*, by the same.—On some phenomena observed in the botanical garden of Poppelsdorf, near Bonn, during the summer of 1875, by Herr Körnicke.

SOCIETIES AND ACADEMIES

LONDON

Royal Astronomical Society, January 12.—Mr. William Huggins, D.C.L., president, in the chair.—Mr. Robert John Baillie, Mr. Henry Vere Barclay, the Rev. Daniel Dutton, Mr. Samuel Haywood, Dr. Louis Stomeyer Little, Mr. Richard Pearce, Commander William James Lloyd Wharton, R.N., H.M. surveying ship *Fawn*, and Mr. Jesse Young, were elected Fellows of the Society.—A paper by Mr. Marth giving an ephemeris for the satellites of Uranus for the year 1877, was read. This is one of a series of papers which Mr. Marth has presented to the Society giving ephemerides useful for physical observations of the major planets and their satellites. It was remarked by the president that these ephemerides involve much labour in their construction, and the astronomical world is greatly indebted to Mr. Marth for their production.—A paper by Prof. Harkness on the theory of the horizontal photoheliograph was read. The instrument consists of a heliostat and a long focussed object-glass, in the principal focus of which the negatives are taken; the distortion produced by secondary magnifiers is thus avoided, and very accurate means are adopted for determining the shrinkage of the collodion film upon the plate and the accurate orientation of the photograph.—Mr. Wentworth Erck read a paper on an improved eye-piece for viewing the sun. His method is to use a small glass prism as a reflector which is placed within the image of the sun, so that only a portion of the rays from a part of the disc are reflected into the eye-piece at any one time; the effects of heating are thus reduced to a minimum, and for viewing small areas of the sun the eye-piece is preferable to that suggested by Mr. Dawes in which the light of the whole image is reflected and the small area to be observed is viewed through a diaphragm which is exposed to the heating effects of the reflected rays.—A paper by Mr. Knott was presented to the society; it contains a catalogue which he has been some years in preparing, and gives a very large number of micrometrical measures of double stars which have been made with a very fine eight-inch refracting telescope formerly the property of Mr. Dawes.

Chemical Society, January 18.—Prof. Odling, F.R.S., vice-president, in the chair.—The secretary read a paper by Dr. Jäger on some derivatives of dithymyltrichlorethane, a substance produced on adding a mixture of sulphuric and acetic acids to a mixture of thymol and chloral. By heating this compound with zinc dust it yields dithymylethane and dithymylethene.—Mr. Kingzett then read a preliminary notice by Dr. Heike and himself on some new reactions in organic chemistry and their ultimate bearings, showing that the colour reaction known as the "Pettenkofer reaction" produced by the action of sulphuric acid on sugar and cholic acid extended to many other substances, some of which did not require the admixture of sugar to produce the colour. This was followed by a paper on dinitroso-orein and dinitro-orein, by Dr. J. Stenhouse and Mr. C. E. Groves, in which the methods of preparation and properties of these compounds were fully described.—The last communication, by Mr. T. Carnelley, was on high melting points with special reference to those of metallic salts, Part 3.—The meeting was then adjourned until Thursday, February 1.

Zoological Society, January 16.—Prof. Newton, F.R.S., vice-president, in the chair.—Capt. H. W. Feilden, exhibited and made remarks on some of the birds collected by him in the Arctic regions during the recent North Polar Expedition. Sixteen species were enumerated as having been met with on the shores of the Polar Basin, and north of 82° N. lat., but some of these only occurred as stragglers.—The Rev. Canon Tristram exhibited and made remarks on a specimen of a rare terrestrial Dormouse (*Eliomys melanurus*), obtained by him in Southern Palestine, where it is found in desert places.—Mr. P. L. Slater, F.R.S., exhibited and called attention to a collection of mam-